The impact of national traditions and cultures on national foresight processes

Andersen, Per Dannemand; Rasmussen, Lauge Baungaard

Published in:
Futures The journal of policy, planning and futures studies

Link to article, DOI:
10.1016/j.futures.2014.01.013

Publication date:
2014

Document Version
Early version, also known as pre-print

The impact of national traditions and cultures on national foresight processes

Per Dannemand Andersen*, Lauge Baungaard Rasmussen
Department for Management Engineering
Technical University of Denmark
Produktionstorvet 424, 2800 Lyngby, Denmark

*corresponding author: pean@dtu.dk, +45 4525 4535

Abstract:
This paper addresses the influence of national traditions, styles or culture on the use of foresight in decision-making processes. Inspired by sociologists' contributions on national culture, the paper demonstrates that two dimensions of national culture, power distance and uncertainty avoidance, are useful in the characterisation of the context in which national foresight exercises are carried out. The paper is based on two Danish cases: The Danish Government's Globalisation Strategy, from 2005, and the Danish Research 2015 process, from 2008, which focus on priority settings for strategic research.

Keywords: Foresight, governance, national culture, policy making.

1 Introduction

This paper originates from two issues that are being discussed in the current academic literature on foresight and in the international foresight community. The first issue concerns the integration of foresight into national policy-making processes. Foresight projects have often been carried out as stand-alone activities and have been partly decoupled from the processes into which the results of the foresight must feed. Many foresight exercises have had no impact on policy-making. This lack of impact has led policy-makers to require that the content of foresight exercises relate to current political agendas and that their processes relate to policy making processes [1]. Academic research has also explored this issue, focusing on different characterizations and typologies of foresight projects [2] [3]. The literature has suggested that foresight must be an integral part of policy-making processes [4], and concepts such as adaptive foresight [5] and systemic foresight [6] have been suggested for the development of more tailored foresight processes. Among the contributions to this discussion, the key conclusion is that there is no 'one-size-fits-all' approach to foresight. Context matters.

The fact that context matters leads to the other issue that this paper originates from, namely, the context to which foresight processes are to be adapted. In a discussion of the use of the concept of systems thinking in foresight, Saritas distinguishes between external and internal context [6]. The external context is the set of STEEPV factors (Social, Technological, Economical, Environment, Political and Values) that affect the content of a foresight exercise. The internal context relates to the structures and behaviours of the organisation or system in which a foresight exercise is organised and carried out. This organisation or system includes all parties and institutions (e.g. administrative system and political

system) that are involved in the performance of a foresight process and implementation of the results. This paper focuses on internal context.

There is no doubt that each foresight exercise must be narrowly adapted to its actual context. Nevertheless, both practitioners who are carrying out foresight processes and academics who are studying foresight processes need to simplify the real world through different characterisations and typologies of both foresight projects and their contexts. The literature has suggested several simplified contexts for foresight.

Some of the literature has suggested that a decisive context for national foresight exercises relates to the size of the country. The seminal book Foresight in Science by Irvine and Martin analysed processes in France, West Germany, the United States and Japan, which were, in effect, the world's four largest economies at that time [7]. In opposition to this focus, several papers have analysed foresight processes in small countries. In a paper titled 'Foresight in Smaller Countries', Crehan and Harper analysed foresight in Malta, Cyprus and Estonia [8]. In another example, Glod, Duprel and Keenan recently published a paper entitled 'Foresight for science and technology priority setting in a small country: the case of Luxembourg' [9].

Other literature suggests that geographical regions are a useful form of contextual categorisation. The Handbook of Technology Foresight, has chapters on four of such regions: the Nordic countries, industrialising Asia, Latin America, and Central and Eastern Europe [10]. The chapters in the handbook explicitly consider the variety of approaches and contexts within each region, but apparently, the authors still find the clustering of such regions useful. We recognise, of course, that for some authors, the selection of geographical regions might be used, primarily, for simple structuring of a text or a book and not as a deliberate analytical approach.

In line with this regional approach to contextual categorisation, Keenan and Popper have discussed regional styles of foresight for six regions [11]. The decisive context in Keenan and Popper's work is differences in political tradition: established democracies (as found in Northwest Europe and North America), third wave democracies (as found in Southern and Eastern Europe and South America), and Asian democracies. In section 2.3, we will further examine this approach. Countries' or regions' political culture might be closely related to national governance culture. Havas et al. use governance culture to distinguish between the innovation policies in Western European countries, on the one hand, and Central and Eastern European countries (CEE) and newly independent states (NIS), on the other hand [3]. However, Havas et al. do not proceed further into any systematic characterisation of the two traditions.

This paper starts with the somewhat ambiguous concepts of national political tradition and national governance culture as decisive contexts for analysing and using foresight in policy-making. The paper argues that this concept provides a more useful approach to the decisive context of foresight than the size or regional affiliation of a country. Hence, the aim of this paper is to contribute, in general, to the discussion of national (or political, governing, and industrial) culture's effect on national foresight exercises, and more narrowly, on priority setting in science, technology and innovation policies.

In the paper, we broadly adopt the European Foresight Platform's definition of foresight as '*a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilising joint actions'.* In parallel with the term 'foresight', the term 'future-oriented technology analysis (FTA)' is used by the European Commission's Joint Research Centre Institute for Prospective Technological Studies (JRC-IPTS), for example. JRC-IPTS has defined FTA as '*a common umbrella term for technology foresight, technology forecasting and technology assessment'* [12]. As, in practice, both foresight and FTA draw on, by and large, the same methodological foundation, this paper draws on the literature for both terms.

The structure of the paper is as follows. Following this introduction, section 2 briefly resumes the discussions on national culture and introduces a conceptual framework for analysing cultural differences in foresight and planning. Section 3 contains background information on the Danish economy and culture, including a) the Danish position between liberal and coordinated market economies, b) Danish traditions and styles for governmental long range planning and policy making, and c) Danish experiences with technology foresight. Empirically, this section is based on publicly available reports and internet information from relevant governmental bodies (ministries and agencies). Section 4 presents two cases: The Danish Government's Globalisation Strategy, from 2005, and the Research2015 process, from 2008. In both cases, the impacts have been significant and largely measurable in new legislation and budget allocations. The Globalisation Strategy and the Research2015 process are two attempts to combine the strong Danish tradition for political compromises, negotiations and stakeholder inclusion with evidence- and expertise-based prospective elements. Empirically, the section is based on publicly available reports, in particular, the Research2015 project web page and evaluation report. Section 4 concludes with a discussion of the findings in the two cases. In section 5, the major conclusions are reviewed and discussed.

2 National traditions and governance culture as context for foresight

In this section, we introduce a conceptual framework of national traditions and governance culture for analysing foresight and priority setting in science, technology and innovation policies.

2.1 Sociologists' and anthropologists' perception of culture

Cultural differences and styles are very hard to quantify, and whether such items can be quantified at all is debated. The understanding and definition of culture differ depending on the intended use and the academic discipline. Sociologists who focus on community and organisation levels view culture as something that somebody "has" [13–16]. However, anthropologists view culture as the fundamentals of existence. Anthropologists view cultures as something that an entity "is" [17], [18]. Organisational culture is the shared perception of daily practices within a specific organisational context [13], [15]. In contrast, national culture relates to people who are within a certain national context.

One of the most comprehensive and acknowledged studies of national styles in management, decision making and planning was carried out by Dutch psychologist and anthropologist Geert Hofstede [19]. In this study, we use Hofstede's definition of culture. He defines culture as *"…the collective programming of mind which distinguishes one national group or category of people from another ….(thus)…. The interactive aggregate of common charac-*

teristics that influence a human group's response to its environment" [20]. According to Hofstede, culture is not directly observable. However, it can be analysed by studying observed behaviour, mimicry, clothes, or statements. Shared national values impact institutional and organisational thinking and acting within a national context. However, according to Hofstede, organisational behaviour is only supposed to have a small impact on national culture.

2.2 Hofstede's dimensions of national culture

Hofstede takes a bipolar and multi-dimensional approach to the measurement of national culture. His dimensions are constructed across nations, and he considers them to be meaningless as descriptors of individual or organisational differences [21]. His dimensions were all constructed in such a way that they addressed fundamental issues, which he believes all societies must address.

In his original study from the 1970s, Hofstede analysed cultural differences based on attitude questions that were asked of IBM employees in 40 countries. The analyses have later been extended to other types of organisations and countries, and covered 76 countries by 2010 [22]. In the original study, Hofstede presented four dimensions of culture (see table 1) [20]. In later works, Hofstede added a fifth dimension: long-term versus short-term orientation [22]. However, data on this dimension are only available for a much smaller number of countries, and no data are available for Denmark.

Dimension	**Description**
Power Distance	The extent to which the less powerful members of organisations and institutions accept and expect that power is distributed unequally.
Uncertainty Avoidance	Tolerance for uncertainty and ambiguity.
Masculinity	Refers to the distribution of roles between the genders, which is a fundamental issue for any society and for which a range of solutions are found.
Individualism	The degree to which individuals are integrated into groups.

Table 1. Hofstede's cultural dimensions [19]**.**

Two dimensions are of special interest for this paper: *power distance* and *uncertainty avoidance*. These two dimensions are of interest in foresight because, as Hofstede notes, these two dimensions have obvious consequences for the way in which institutions and organisations are built, and he discusses the implication of each dimension for management and planning. As we will elaborate in the following, both the power distance and uncertainty avoidance might affect the use of foresight in at least three areas: the use of longer-term planning tools such as foresight in general, the selection of foresight methods, and the inclusion of experts and citizens.

The *power distance* dimension has implications for societies' need for subordinate consultation and thus for participatory elements of foresight exercises. According to Hofstede,

societies with significant power distance, ‘rulers’ are less likely to consult with citizens. The concept of ‘rulers’ or powers include different types of authorities and their institutions, such as not only government but also influential stakeholder groupings and experts. Societies with lower power distance might be more likely favour interaction (citizen consultation) based foresight methodologies, such as Futures Workshops, Citizens Panels and Conferences/Workshops. In high power distance societies, we could expect expertise and evidence based foresight methodologies, such as Expert Panels, Interviews, Modelling and Literature reviews.

The *uncertainty avoidance* dimension has several implications for national management and planning cultures. In particular, three of these implications relate to foresight: types of planning, meaning of time, and tolerance for deviant ideas.

The first implication of the uncertainty avoidance dimension on foresight relates to a society’s view on planning in general. Even among wealthy and highly developed democracies, it is possible to find differences in planning practices. In countries with more uncertainty avoidance, such as France and Japan, short-and medium-term scheduling and planning receive more attention than in countries with less uncertainty avoidance, such as Great Britain and Denmark. Conversely, strategic planning presupposes a distancing from the certainties (and known uncertainties) of the past and a significant amount of tolerance for new uncertainties. There are most likely few risks affiliated with carrying out significant foresight exercises, but implementing the results into real policies might be difficult in a society with more uncertainty avoidance. A more careful investigation might reveal that societies with lower levels of uncertainty avoidance might be less willing to launch significant foresight exercises but more willing to implement bold new policies that may result from a foresight exercise.

The second implication of the uncertainty avoidance dimension on foresight relates to the meaning of time and thus on how the future is perceived. According to Hofstede, the uncertainty avoidance dimension impacts the question of “*how a society reacts on the fact that time only runs one way and that the future is unknown: whether it tries to control the future or to let it happen”* [19]. In countries such as France and Japan with a high uncertainty avoidance indexes, time and the future are considered to be something that should be mastered and exploited. In contrast, in countries with lower uncertainty avoidance, such as Denmark or Great Britain, time is merely a framework for orientation rather than something to be mastered. Adaption to upcoming changes might be considered more important in these countries.

The third implication of the uncertainty avoidance dimension on foresight relates to tolerance for deviant ideas. Countries with strong uncertainty avoidance maintain rigid codes of belief and behaviour and are intolerant of deviant persons and ideas. Hofstede notes that in countries with strong uncertainty avoidance, deviant opinion on business, scientific, or political issues is associated with personal antipathies. In societies that have more uncertainty avoidance, foresight processes might be seen to create a political battlefield where stakeholders with conflicting viewpoints seek to win the battle, whereas stakeholders in societies that display less uncertainty avoidance are more likely to seek consensus. However, Hofstede also that in countries with weak uncertainty avoidance new ideas might just be ignored and not necessarily accept. The tolerance for deviant ideas also has implica-

tions for the selection of methods that include stakeholders in a foresight process. It is well known that the anonymity of Delphi Surveys allows respondents in uncertainty avoiding societies, such as Japan, to express view points and disagreement without involving personal sym- or antipathies. Conversely, Consensus Conferences and User Panels are widely used in Denmark, which has a lower uncertainty avoidance index.

Figure 1 shows a selected number of countries' scores on the power distance index and uncertainty avoidance index. From the figure, it is quite obvious that large differences exist even among established democracies in Western Europe. It is striking that a few clusters can be identified. An Anglosphere cluster of countries (Great Britain, Ireland, USA, Canada, Australia and New Zealand) has a relatively low index for both uncertainty avoidance and power distance.

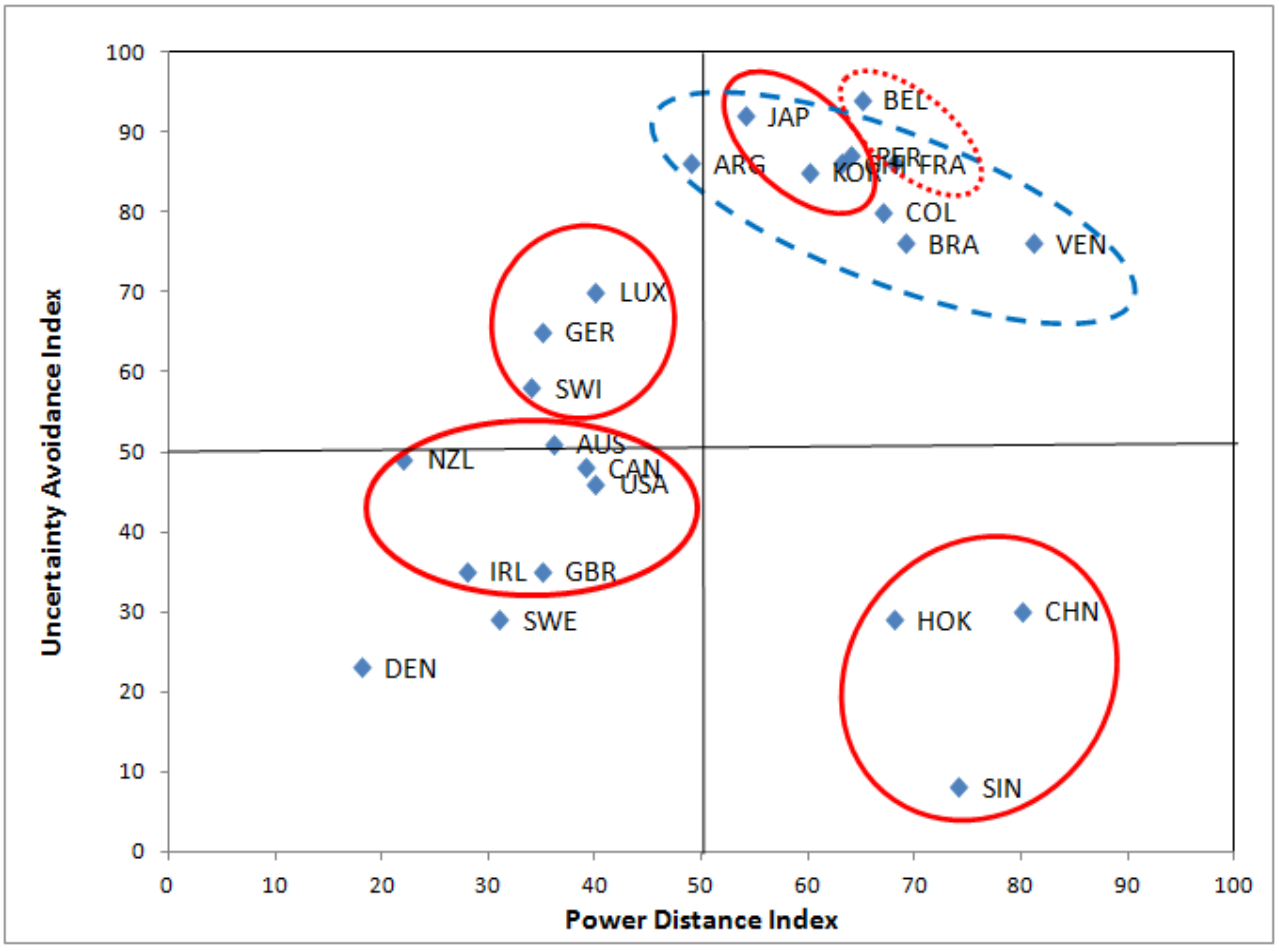

Figure 1. Uncertainty avoidance index and power distance index for a selected number of countries. Based on Hofstede [19]**. The authors of this paper are responsible for the selection of countries and for the indicative groupings.**

In contrast, there is a Francosphere cluster of countries (France, Belgium), which has a relatively high index for both uncertainty avoidance and power distance. France and Belgium are marked with a dotted circle in the upper right quadrant of figure 1. Between these clusters is a Germanosphere cluster (Germany, Switzerland and Luxembourg), which is

characterised by a relatively small power distance and relatively strong uncertainty avoidance.

A group of South American countries (Chile, Colombia, Peru, Venezuela, Brazil, and Argentina) constitutes a distinct cluster that has a high uncertainty avoidance index and a medium to high power distance index. This cluster is marked with a dashed ellipse in figure 1.

Finally, it is interesting to note that the included Asian countries all have relatively high power distance but differ significantly with respect to uncertainty avoidance. Countries such as Japan and South Korea have relatively high uncertainty avoidance indexes, whereas other Asian countries, such as Singapore, Hong Kong, China (and also, India and Indonesia), have low uncertainty avoidance indexes.

As seen, Denmark is characterised by a very low index for both uncertainty avoidance and power distance. Among all 50 countries that are included in Hofstede's analysis, Denmark ranks as the 3rd lowest for both uncertainty avoidance and power distance. Sweden is added in figure 1 for comparison.

2.3 Varieties of capitalism: The Danish hybrid

Hofstede's cultural typology needs to be supplemented with a socio-economic typology in order effectively to analyse the national specificity of foresight exercises.
In an influential book 'Varieties of capitalism' [23] the political economists Hall and Soskice distinguish between Liberal Market Economies (LME) and 'Coordinated Market Economies (CME).

> LME *"…tend to rely on markets to coordinate endeavours in both financial and industrial relation systems"…..,* while CME *"…have institutions in both spheres that reflect higher levels of non-market coordination*"[24].

Examples of LME are Britain, Ireland, Australia, New Zealand, Canada and the USA. In contrast, Germany, Austria, Switzerland, the Netherlands, Belgium, Finland, Sweden, Norway, Denmark and Japan are mentioned as examples of CME.

Although Denmark is classified as a CME by Hall and Soskice, the Danish socio-economic aspects also contain features from the LME type [25]. From a socio-economic perspective, therefore, Denmark is more of a *hybrid* between CME and LME, than Hall and Soskice have recognized. For example, one LME aspect is that major Danish firms finance a large part of their research and development themselves. An even more important LME aspect is that Danish firms and public institutions have substantial freedom to hire and fire not only unskilled but also highly skilled staff. Therefore, managers, specialists, craftsmen, etc. often shift employment from one company to another or from a public institution to a private firm. This mobility process enhances the knowledge transfer and networking between organizations and individuals across company levels and private/public sectors. However, Denmark retains also many features of the CME-type. For instance, wages, work conditions, and certain types of education are negotiated through industrial level bargains between trade unions and employer associations. In addition it relies on employer and employee associations to supervise a public subsidized training and education system. A

considerable amount of technology development is financed by public or quasi-public institutions. This hybrid socio-economic position of Denmark – combined with the cultural aspects of low levels of power distance and uncertainty avoidance - have important implications for the specificity of the foresight exercises in Denmark. First, due to the dense economic and social relationships between public and private organizations, participatory and consensus seeking approaches have more appeal to policy makers than deep, scientific expert analysis of available knowledge. Second, the strong traditions for central negotiation at the industrial level in Denmark between employer and employee associations for instance about productivity enhancing means make it more appropriate and convenient for the Danish government to include the industrial partners in the process of discussing and formulating the technology foresight programmes. Third, the low level of power distance and uncertainty avoidance combined with dense networking and knowledge transfer between public and private institutions and companies in Denmark support the initiation of participatory consensus approaches.

2.4 National styles in foresight and foresight methods

In a recent paper, Keenan and Popper discussed regional styles in foresight. In their context, the term “regional” refers to geographical clusters of countries[11]. Countries are clustered into 6 regions: Northwest Europe, Eastern Europe, Southern Europe, North America, South America and Asia. The key argument is that the way in which a foresight exercise is carried out reflects three factors, of which two are the most important. The first factor is the contextual landscape in which the foresight activity is embedded. This landscape includes local economic, political and socio-cultural contexts that might differ from region to region. Keenan and Popper focus on foresight as a political instrument, and naturally, make some simplifying assumptions about political traditions. This simplification leads to a categorisation of countries into three distinguishing political traditions: 1) established democracies, as found in Northwest Europe and North America, 2) third wave democracies, as found in Southern and Eastern Europe and South America, and 3) Asian democracies. The second factor is the history of foresight diffusion and adoption. The key point of view here is that history matters in the sense that foresight activities are often inspired by earlier activities in other countries.

For each of the six regions, Keenan and Popper compare issues such as scale of participation in the foresight project and methods used. Here, Keenan and Popper rely on another paper by Popper, which suggests a taxonomy for foresight methods [26]. Popper suggests that foresight methods can be characterised by their ability to gather or process information, based on four abilities: evidence, expertise, interaction and creativity, or combinations of these abilities. Creative abilities refer to the mixture of original and imaginative thinking. Expertise refers to the skills and knowledge of individuals in the particular area of the foresight exercise. Expertise is often used to support top-down decisions, provide advice and make recommendations. Expert Panels and to some extent Delphi-Surveys are examples of foresight methods that have a high content of expertise. Interaction refers to the extent of the inclusion and mutual challenging of views from experts and non-expert stakeholders. Futures workshops and citizens panels are examples of foresight methods that have high interaction content. Finally, evidence refers to reliable documentation, such as statistics and indicators or forecasting of economic development through macroeconomic modelling. Together, the four abilities constitute a four edged diamond that has one ability in each corner of the diamond. According to Popper, most foresight methods

comprise a mix of several of the four abilities. As the practical use of foresight methods varies significantly from case to case, such a categorisation of methods must be considered as only indicative. See figure 2 in section 4.3.

One of the clearest observations in Keenan and Popper's analysis of regional styles in the use of foresight methods is that interaction-oriented methods, such as futures workshops, are prominent in Northwest Europe and North America and less prominent in Eastern Europe and Asia. At the same time, an expertise-based method, such as the Delphi method, is in common use in South Europe and South America and totally absent among the top 10 foresight methods in Northwest Europe and North America. Keenan and Popper suggest (with a great deal of precaution) that this difference reflects the democratic culture of these regions.

Hofstede's power distance dimension corresponds only to some extent to Keenan and Popper's differentiation of political traditions. One the one hand established democracies in Northwest Europe and North America have, in general, the lowest power distance indexes. This detail supports the point of view that third wave democracies have higher power distance than more established democracies. On the other hand even among established democracies in the Anglosphere cluster and the Germanoshere cluster have significantly different power distance index than equally established democracies in the Francoshpere cluster. Also third wave democracies and Asian democracies constitute two very non-homogeneous groups that have no clear pattern of power distance. This fact challenges Keenan and Popper's factors for explaining variations and similarities in regional foresight data. Thus, the clusters of such landscapes might follow factors other than type of democracy. Furthermore, it challenges the role of the history of foresight diffusion and adoption across and within the regions of many countries. Keenan and Popper's study indicates that such regional patterns exist, but the foresight activities of each country might reflect, to a higher degree, socio-cultural traditions of power distance and uncertainty avoidance than foresight traditions in neighbouring countries.

3 The Danish context in relation to foresight

The intention of this section is to sketch elements of Danish "style" foresight based on the socio-economic and cultural features described above.

3.1 Danish traditions and cultural context of governmental foresight and long range planning

As history and cultural context are important, this section contains background information for understanding the use of governmental foresight and long range planning.

Denmark was not among the first countries to adopt foresight and similar systematic processes in policy making in science, technology and innovation policies or other policy areas. This late adoption may be due to several reasons.

First, during the 1970s, Denmark had some rather negative experiences with prospective planning. In two prospective plans (Perspektivplan I and II) from 1971 and 1974, the government analysed social trends and developments 15 and 20 years ahead for the public and private sectors, respectively. However, the studies did not foresee the oil crises and

the economic crises of the 1970s, and this gave such analyses a rather negative reputation among economists and planners in government.

Second, Denmark's tradition of basing policy decisions on analyses of available knowledge is weak. This was exposed through a very large research project 'Democracy and Power in Denmark' that was launched by the Danish Parliament shortly before the new millennium [27]. The purpose of the project was to analyse the state of the Danish democracy at the start of the 21st century. One of the conclusions of the study is that the basis for political decisions often bears the imprint of negotiation rather than systematic analyses of the problems:

> '*Denmark has never had strong traditions for basing political decisions on accessible knowledge – as opposed to Sweden, for instance. The scientific/analytical level in Danish white papers has generally been low. White papers have often seemed negotiated rather than analytical presentations of political issues. ..*
>
> *It almost seems as though there is a guiding principle a la "We'll figure it out as we go – we can always fix things if there are unforeseen and unfortunate consequences".'* [27]

Furthermore, the Democracy and Power study concluded that the power gap in Danish society has almost disappeared. This reduced power gap also applies to the citizens' relationship with experts, whose authority has faded. This conclusion supports Hofstede's much earlier finding that Denmark has very low power distance. Thus, in Danish political contexts, participatory and consensus elements have, most likely, more appeal to policy makers than systematic and analytical elements.

The Power and Democracy project's conclusion also supports Hofstede's categorisation of Denmark as a low uncertainty avoidance society. The focus in Denmark seems to be set on "We'll figure it out as we go" and not on medium- to longer-term planning.

Third, science and technology have traditionally played a less important role in Denmark than in most of the comparable OECD countries. As late as the 1980s, the Danish governmental expenditure on research and development (R&D), relative to the country's gross national product (GNP), was among the lowest of the OECD countries. Consequently, there was less need for policy mechanisms like foresight to define priorities for the governmental expenditure on R&D.

Finally, for several decades, the Danish Board of Technology (DBT) has played an active and internationally recognised role in the political and wider public debate that concerns the potential and consequences of science and technology. DBT has been serving as parliamentary technology assessment and utilised interaction-oriented methods, such as futures workshops, citizen panels and consensus conferences. It must also be noted that together with the other Nordic countries, Denmark has a well-established tradition of policy evaluation, which also includes science and innovation policies. The combination of the widespread use of policy evaluations and the DBT's parliamentary technology assessment

might have constituted a platform for policy making that would make the need for foresight less urgent.

But this context has changed during the recent decade. Based on the Danish Globalisation Strategy from 2005, public expenditures on R&D have increased. Consequently, today, Denmark is among the OECD countries with the highest public expenditures on R&D. Another major initiative of the Globalisation Strategy was an increase in the percentage of public research funding that should be subject to competition. In 2005, two thirds of Danish public research funding was appropriations directly to universities and research centres, and the goal was to increase the competitive portion from one third in 2005 to one half in 2010. Funding, especially, is made available for strategic research. A Council for Strategic Research has been established to contribute to increased co-operation between public and private research within a range of areas of strategic importance for the country.

In conclusion, historically, Denmark has had a weak tradition of applying foresight and similar systematic, forward-looking processes in national-level policy making. However, this context has changed during recent decades with increased national R&D budgets and the establishment of a strategic research council. This changing context has created a need for foresight—understood to be political priority-setting for strategic research.

3.2 Danish experiments with technology foresight

In a green paper from 1995, the Danish Research Council for Research Policy recommended that the Ministry for Science consider utilising futures studies in affiliation with its strategy processes [28]. The council also recommended that the ministry assessed international experiences in this area and refer to foresight programmes in the UK, Germany, the Netherlands and Japan. In 1998, the Danish Board of Technology established an independent working group to analyse and assess the feasibility of a technology foresight programme in Denmark. In this study, technology foresight was defined as "*dialogue activities and analyses of long-term developments in science, technology, economy and society with the aim of identifying technologies which may have economical and/or societal significance*" [29]. The working group recommended that the Danish parliament launched a program for technology foresight that has a budget of DKK 25 to 30 million (ca. EUR 3.3 to 4.2 million) over three years.

A technology foresight programme was established with the centre-left government's 2000 business development strategy [30]. The strategy contains the following statement: '.. *the Government will take the initiative to implement a project on technology foresight in Denmark. The aim is to increase knowledge and improve the decision-making base for investments in technology development in Denmark. The project can be done in connection with public investments in technological service and in connection with larger interdisciplinary research groups, for example*[1]'. Hence, technology foresight was seen to be part of the government's business policy and not, in particular, part of science policy, and the project was initially placed in the then Danish Agency for Business Development. A pilot programme for foresight was launched early in 2001. The allocated budget consisted of DKK 24 million (ca. EUR 3.2 million) for the period of 2001 to 2004. Following the general elections and the change of Government in November 2001, the ministries were reorganised,

[1] Authors' translation.

and the technology foresight programme was moved to the new Ministry of Science, Technology and Innovation. Also following the change in Government, the budget for the technology foresight programme was reduced to DKK 18 million (ca. EUR 2.4 million). Under this pilot programme, nine technology foresight exercises were carried out in three rounds. Following the second round, an additional two exercises were carried out by the Agency for Forest and Nature and the Agency for Environmental Protection. Due to the experimental nature of the programme, a range or foresight methods were tested during the eleven projects. Neither the entire programme nor the individual projects were evaluated.

Although Denmark was not among the first countries to adopt foresight explicitly, it must be noted that over several decades, Denmark has carried out foresight-like processes and strategic planning within individual sectors. For example, various energy action plans have many similarities to foresight, both with regard to the processes and results. Another example is the widespread use of futures workshops and citizens panels in municipal and regional planning. In the latter case, the focus is on the inclusion of and interaction with the wider public and not on expertise-oriented types of foresight methods.

4 Two Cases: The Globalisation Strategy and the Research2015 project

This section briefly describes two cases of forward-looking policy making in Denmark. First, the section describes the Danish government's 2005 Globalisation Strategy. The Globalisation Strategy aimed at a very broad range of policy areas. This strategy provided political impetus for the Research2015 project, which is the second case. Research2015 aimed to set priorities for the government's strategic research programme – or at least, parts of this programme.

4.1 The government's Globalisation Strategy

In the spring of 2005, the government launched a process that was to meet the Grand Challenge of increasing globalisation. The aim was to meet this challenge by developing a vision and a strategy for transforming Denmark into a leading growth, knowledge and entrepreneurial society. The work was set up in the wake of the government program "New Goals", which the re-elected government presented after the general election in February 2005.

The government established an internal Committee of Ministers and a broad-based Council for Globalisation, which was meant to advise the Committee Ministers on this strategy. The Globalisation Council consisted of 26 members, who were leading figures in business, labour market organisations, universities and the government. The Prime Minister was Chairman of both the Committee of Ministers and the Council for Globalisation, and the Minister on Economics and Business Affairs served as Vice-Chairman of the Globalisation Council. The latter also held the position as Vice-Prime Minister in the two-party coalition government. In addition, the Minister of Finance and the Minister for Science, Technology and Innovation participated.

From April 2005 to April 2006, the Globalisation Council held 15 meetings. The meetings typically lasted for two days, from lunch to lunch. The first meeting was a kick-off meeting, and the following three meetings discussed the Grand Challenges that Denmark faces. These meetings were partly initiated by some background papers that were prepared by

the secretariat of the Globalisation Council. The two last meetings covered the overall strategy. The intermediate meetings involved the discussion of nine themes.

For each meeting and each theme, a discussion paper was prepared that contained the government's overall objectives for the theme and key data and pre-requisites. Additionally, a number of background notes and fact sheets were distributed among the council members. The background notes were prepared by senior staff in relevant ministries. On the first day of the meetings, a number of Danish and international presenters who were either experts on the meeting's theme or representatives of relevant non-governmental organisations were invited. Relevant ministers also participated. There were typically 40-50 people at these meetings. Agendas, attendee lists, and background notes were posted on the website www.globalisering.dk, and after each meeting, a press conference was held by the Prime Minister and the Minister of Economics and Business Affairs Minister (chairman and vice-chairman of the Globalisation Council, respectively). In light of the Globalisation Council's work, in April 2006, the government presented an overall strategy for Denmark in the global economy: 'Progress, Innovation and Cohesion Strategy for Denmark in the Global Economy' [31]. The Globalisation Strategy had 14 focus areas. The following are examples: '1. World's top performing primary and lower secondary school' and '8. More competition and better quality in public sector research'. For each of the focus areas, the Globalisation Strategy defined two to four strategic objectives and a number of initiatives for promoting the objectives – typically 8 to 10. The suggested initiatives were subsequently translated into political initiatives and legislation.

The Globalisation Strategy garnered wide party support in the parliament, including both the three parties behind the government and two opposition parties.

4.2 The Research2015 project

One of the suggested initiatives for the Globalisation Strategy concerned a 'better basis for prioritising', which aimed to strengthen the basis for the political priorities of funding for strategic research. The intention was not to launch strategic research as a scientific underpinning of political priorities. Contrariwise, the aim was to prioritise strategic research in areas of political interest. The initiative should identify the research needs created by societal and business developments as well as the capability of Danish research institutions to meet these needs. The identification should be based on consultations and dialogue processes with ministries, institutions and non-governmental organisations, for example. Every four years, such a process should result in a catalogue of important themes for strategic research. The catalogue should constitute a basis for priority-setting, and it could constitute a common reference framework for the Danish Parliament's political negotiations for the allocation of resources for strategic research. This initiative provided the background for the Research2015 process, which was initiated by a passage in the Parliament in November 2006 as part of the national budget negotiations for 2007. The catalogue that resulted from Research2015 was presented in May 2008. The task of coining out the priorities that was identified in the catalogue was given to the Danish Agency for Science Technology and Innovation (DASTI).

The Research2015 process included four phases. The first phase involved a broad mapping of the strategic research needs. This mapping was conducted from March to October

2007. The mapping consisted of three parts. On behalf of DASTI, the OECD's International Futures Programme Unit carried out an international horizon scan, which led to 125 important trends and grand challenges. The report comprised approximately one page of text for each international trend or challenge and its relevance for Denmark [32]. Another phase was a public internet-based hearing for all interested parties. This hearing resulted in 432 proposals for themes from individual citizens, universities, non-governmental organisations, public committees and councils, and private companies. Furthermore, ministries contributed 90 proposals [33]. The evaluation found that 64% of all proposals came from the public research and education sector, and only very few (less than 10%) proposals came from citizens who had no affiliation to this sector or to other major interest groups [33].

The second phase included an analysis of the received material from phase 1. The material was analysed by an independent expert panel that consisted of eight members with the aim of identifying coherent research themes in the received material. The members of the expert panel were appointed by the Strategic Research Council based on nominations from Ministries, industry and interest groups. Initially, three criteria or definitions of the themes were defined. The proposals should be oriented to challenges or opportunities, be broad enough to ensure effective competition among Danish research environments in the call for proposals for strategic research funding, and should play a central role in meeting the thematic challenge or should be useful in other ways. The expert panel had relative freedom to carry out the clustering of the themes, but it was stressed that their work should reflect the main thrust of and refer back to the original material. The evaluation of the process revealed that the material from the OECD horizon scan was only used to a very limited degree. The OECD report merely served as background information or as a kind of check list [33]. The available material contains no information on why this was the case. The expert panel structured the material into 42 proposals for strategic research themes. The 42 proposals were exposed to a user panel that consisted of some 50 persons from businesses, public authorities and non-governmental organisations that were designated not only on the basis of their personal competences but also their links to major stakeholder groups in Danish society. The user panel met for a workshop to refine the proposals. The user panel revised and reduced the 42 proposals to 31 proposals for future strategic research themes.

The third phase included the completion of the final catalogue. This phase consisted of dialogue meetings between the expert panel and the Strategic Research Council, the Council for Independent Research, Individual Ministries, and industry and non-governmental organisations. In this phase, the number of themes was reduced to 21. See Box 1.

The fourth phase included the implementation of the results as political priorities for strategic research. This implementation came in the form of political negotiations in the context of the budget bill for 2009, 2010 and 2011. During the parliament's budget negotiation in 2008 approximately half of the 21 themes were prioritized and received each a budget. Thus, the catalogue constituted the basis for prioritisation for the next three years. However, other factors, particularly the Parliament's energy agreement, have contributed significantly to the prioritisation process. The key actors in this phase were the five negotiators from each of the five parties that were behind the Globalisation Strategy.

BOX 1. Final priorities in the Research2015 catalogue [34]

Energy, climate and the environment
- Energy systems of the future
- Future climate and climate adaption
- Competitive environment technologies

Production and technology
- Bio resources, food and bio products
- Intelligent solutions for society
- Production systems of the future
- Strategic growth technologies

Health and prevention
- From basic research to individualised treatment
- Chronic disease between prevention and rehabilitation
- Human health and safety in the interaction with environment factors
- Healthy lifestyle – what creates change?

Innovation and competitiveness
- Denmark's competitiveness
- Innovation
- The public sector of the future

Knowledge and education
- Education, learning and competence development
- What works? Evidence in practice
- Knowledge production and dissemination of knowledge in society

People and societal design
- Sustainable transport and infrastructure
- Better life-space – space for life and growth
- Cultural understanding in a globalised world
- Changing lives.

During the parliament's budget negotiation in 2008, approximately DKK 1 bn (ca. EUR 134 million) was allocated to strategic research in the two year period of 2009 and 2010. The catalogue formed a basis for the negotiations leading to distributing that amount between selected themes. See table 2. Compared with 1.2 DKK bn, the annual budget of the strategic research council, Research2015 accounts for almost half of the council's priorities. The rest are priorities set by parliament through the typical political negotiations. Compared with total competitive[2] part of the Danish governmental R&D expenditures, which amount to approximately DKK 8 to 9 bn annually, Research2015 only affected a very small part, or 5 to 6 %. An overview of the whole process is presented in table 3.

[2] The total governmental R&D expenditures consist of two parts: a non-competitive part (such as direct appropriations to universities and institutions) and a competitive part (such as funds distributed by research councils and other granting agencies based on competition between many proposals).

Table 2. Implementation in the national budget for strategic research [33]**.**

Theme	Budgets in millions of DKKs 2009	2010
Energy, climate and environment		
• Energy systems of the future	190	455
• Future climate and climate adaptation	43	0
• Climate research centre in Greenland	20	15
• Competitive environmental technologies	10	0
Production and technology		
• Bio-resources, food and other bio products	45	50
• Intelligent solutions for society	0	10
Health and prevention		
• From basic research to individualised treatment	30	20
• Human health and safety in interaction with env. factors	0	19
Innovation and competitiveness		
• The public sector of the future	0	15
Knowledge and education		
• What works? – Evidence in practice	20	0
People and societal design		
• Sustainable transport and infrastructure	25	0

The evaluation of the Research2015 process may be considered a fifth phase. The evaluation focused on both the research process and the result of the process [33]. The general conclusion was that Research2015 was successful. The process fulfilled its two major objectives, it formed an improved basis for prioritisation of strategic research, and that basis was actually used to set political priorities for strategic research. That Research2015's effect on the fiscal act can be verified may be unique in an international context. What is not clear is how the political priorities for strategic research would have appeared without the Research2015 process.

Table 3. Overview of the Research2015 process [33]**.**

Phase	Process	Results	Involvement
1: Mapping	OECD horizontal scanning Public hearing among all interested citizens Input from ministries	125 trends and challenges 432 suggestions 90 suggestions	In principle, everybody interested in strategic research
2: Identification of themes	Expert group analysed the material from phase 1 Workshop with user panel about the 42 themes Expert group revised the 42 themes	42 themes for strategic research Ideas and input for the remainder of the process Reduction to 31 themes for strategic research	Expert group (8 persons) User panel (53 persons)
3: Final proposal	Dialog with stakeholder organisations, ministries and research councils	Reduction to 21 themes for strategic research	Strategic research council (14) Independent research council (18) Contacts in ministries (15) Industry and interest groupings (23) Chairman of Danish universities association (1)
4: Implementation of the Research2015 catalogue in real policy	Political negotiations in Parliament, starting with the Fiscal Act of 2009	Most (>75%) of the 21 themes for strategic research were receiving budgets	Speakers from the parties in Parliament who were behind the budget (5)

4.3 Discussion of the cases

Neither Research2015 nor the Globalisation Strategy was recognised by their key responsible organisations as a foresight exercise or as having used foresight methods. Nevertheless, the Globalisation Council's process included both expertise-oriented foresight methods (expert panels, expert discussion papers), evidence-oriented foresight methods (indicators and fact reports) and interaction-oriented foresight methods (conferences, workshops, stakeholder inclusion). The Research2015 process included foresight methods such as horizon scanning, expert panels, user panels, dialogue meetings, conferences and workshops. In figure 2, the foresight methods that were applied in the two cases are indicated using Popper's Diamond, as described in section 2.4 in this paper.

The two processes also show some traits that are expected for a country that has low uncertainty avoidance and low power distance.

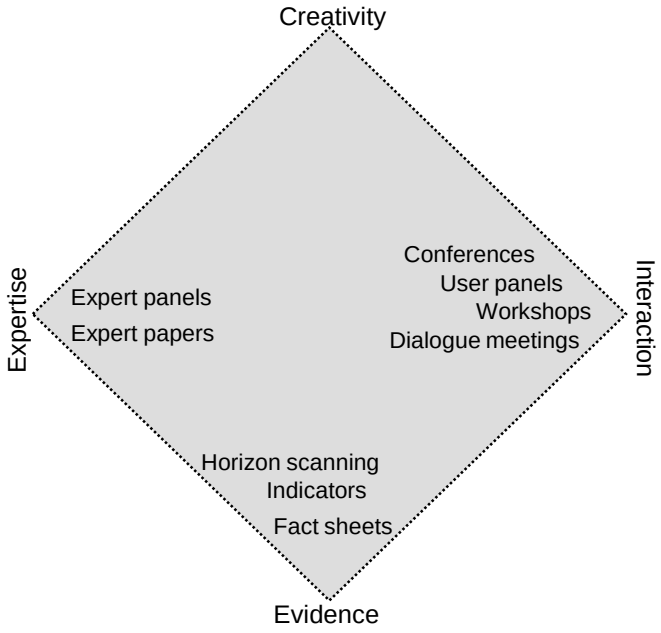

Figure 2. Foresight methods used in the two cases: The Globalisation Strategy and the Research2015 project.

The country's low uncertainty avoidance is reflected in several ways in the two cases. When during the Research2015 process, the expert group worked to reduce the number of themes for strategic research, a lot of uncertainty might have appeared concerning the importance of each theme. Furthermore, new and deviating ideas from actors who had conflicting interests were introduced during the process, and some of these new ideas were included in the final catalogue. Considering Danish society's low uncertainty avoidance, the initiation and implementation of a long-term planning project such as the Globalisation Strategy might be contradictory. Hofstede mentions that it has been shown that strategic planning is actually more popular in countries that display less uncertainty avoidance, such as the UK and Denmark, than in countries that display more uncertainty avoidance [19]. The reason for this is that strategic planning presumes a tolerance for uncertainty and for creating distance from the certainties of the past. Daring new policies, such as the Globalisation Strategy's initiatives on political priority setting for strategic research and the allocation of 50% more public funding for research, require a degree of risk taking and might be difficult to implement in a society with more uncertainty avoidance.

The two processes did include expertise- and evidence-oriented elements (such as the OECD horizontal scan in the Research2015 process or the fact sheets in the Globalisation Council process), but the most important methodological elements, such as workshops, hearings, user panels and other forms of stakeholder inclusion, were interaction-oriented. This orientation reflects a low power distance society's need for subordinate consultation. As concluded by the study 'Power and Democracy', rather than analytical presentations, political negotiations are the main basis for political decisions in Denmark [27]. In the Danish context, a good decision is a decision on which everybody (or at least the key stakeholders) agrees. This stakeholder inclusion might also reflect a belief in distribution of

knowledge and that interaction with stakeholders generates learning. Thus, indirectly a creativity dimension is included in the process.

The advantages of using negotiation in Danish settings are obvious. Due to the low degree of power distance in Denmark, major societal stakeholders expect to be involved in the development process of national research policy strategies. This participative negotiation process, which involves seminars and workshops, provides an obvious opportunity to create a synergy effect due to the creative processes that are shaped by bringing together experiences and ideas from many different interest domains. The dense networks among major societal stakeholders may be strengthened. The research policy strategies that were agreed upon can be enforced as more legitimate and plausible. In this sense, the networking and negotiations among societal stakeholders mirror the '*mobilising joint actions'* content of the European Foresight Platform's definition of foresight, as referred in the introduction of this paper.

5 Conclusion and perspectives

This paper aims to contribute to the discussion of national cultures' effects on national foresight exercises. We proceeded from policy makers' increasingly common requirement that in their content and process, national foresight exercises must be better integrated into the actual national policy making processes. We also proceeded from the perception that there is no 'one-size-fits-all' approach to national foresight exercises. Context matters. Instead of using country size or a country's regional affiliation (such as Western Europe or Asia), we have argued that national governance culture is a more decisive context for analysing and using foresight in policy making.

To qualify the concept of national governance culture, we have suggested drawing on the classical work of Geert Hofstede. In particular, two dimensions of Hofstede's concept have implications for the way in which institutions and organisations are built and for management and planning. The two dimensions are power distance and uncertainty avoidance.

The findings of this paper have implications for foresight practitioners and policy makers. In this paper the concept has successfully been applied for analysing recent foresight in Denmark. The Danish negotiation culture, due to a low degree of power distance and uncertainty avoidance as well as an approach that combines market and non-market coordination mechanisms, cannot be emulated directly in countries that have a very different cultural context. Practitioners must be very careful when transferring experiences between countries and even more careful when planning cross-national foresight exercises. Even between culturally neighbouring countries, such as Denmark and Sweden, large differences exist in governance culture, in addition to differences in industrial structure, academic traditions and so on.

Our findings also have implications for the academic community. Most of the academic foresight literature is of a descriptive and normative type and reflects the practice of foresight in different contexts. We have shown an improved framework for comparing and analysing national differences on foresight. However, there is still much to be understood about national governance cultures' effects on foresight, and there is a need for more systematic research on this topic.

Acknowledgements

An earlier version of this paper was presented at the 4th International Seville Conference on Future-Oriented Technology Analysis (FTA), 12 - 13 May 2011, JRC Institute for Prospective Technological Studies (IPTS) in Seville, Spain. The authors are thankful to Doris Schartinger from the Austrian Institute of Technology for comments on the early version of the paper and to the anonymous reviewers who, in addition to their other useful comments, brought our attention to Hall and Soskice's book Varieties of Capitalism and Saritas' paper on Systemic Foresight Methodology.

References

[1] EFP, "Foresight and Forward-Looking Activities - Exploring New European Perspectives," *Summary of major findings. Kick-off Conference of the European Foresight Platform EFP Vienna, 14/15 June 2010*, 2010. [Online]. Available: . http://www.foresight-platform.eu/wp-content/uploads/2010/06/Key-messages-EFP-Conference-FINAL3-100623.pdf . [Accessed: 20-Dec-2011].

[2] T. Könnölä, F. Scapolo, P. Desruelle, and R. Mu, "Foresight tackling societal challenges: Impacts and implications on policy-making," *Futures*, vol. 43, no. 3, pp. 252–264, Apr. 2011.

[3] A. Havas, D. Schartinger, and M. Weber, "The impact of foresight on innovation policy-making: recent experiences and future perspectives," *Research Evaluation*, vol. 19, no. 2, pp. 91–104, Jun. 2010.

[4] M. Keenan, R. Barré, and C. Cagnin, "Future-Oriented Technology Analysis," in *Future-Oriented Technology Analysis. Strategic Intelligence for an Innovative Economy*, C. Cagnin, M. Keenan, R. Johnston, F. Scapolo, and R. Barré, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2008, pp. 163–169.

[5] E. Eriksson and K. Weber, "Adaptive Foresight: Navigating the complex landscape of policy strategies," *Technological Forecasting and Social Change*, vol. 75, no. 4, pp. 462–482, May 2008.

[6] O. Saritas, "Systemic foresight methodology," in *Forth International Seville Conference on Future-Oriented Technology Analysis (FTA) FTA and Grand Societal Challenges – Shaping and Driving Structural and Systemic Transformations SEVILLE, 12-13 MAY 2011*, 2011.

[7] J. Irvine and B. R. Martin, *Foresight in Science: Picking the Winners*. London: Pinter Publishers, 1984.

[8] J. Crehan and J. Cassingena Harper, "Foresight in Smaller Countries," in *Handbook of Technology Foresight*, Cheltenham, UK: Edward Elgar Publishing, 2007.

[9] F. Glod, C. Duprel, and M. Keenan, “Foresight for science and technology priority setting in a small country: the case of Luxembourg,” *Technology Analysis & Strategic Management*, vol. 21, no. 8, pp. 933–951, Nov. 2009.

[10] L. Georghiou, J. Cassingena Harper, M. Keenan, I. Miles, and R. Popper, *The Handbook of Technology Foresight*. Cheltenham, UK: Edward Elgar Publishing, 2008.

[11] M. Keenan and R. Popper, “Comparing foresight ‘style’ in six world regions,” *Foresight*, vol. 10, no. 6, pp. 16–38, 2008.

[12] C. Cagnin and M. Keenan, “Future-Oriented Technology Analysis,” in *Future-Oriented Technology Analysis. Strategic Intelligence for an Innovative Economy*, C. Cagnin, M. Keenan, R. Johnston, F. Scapolo, and R. Barré, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2008, pp. 1–13.

[13] L. B. Rasmussen, “Interactive Scenario Analysis,” in *Facilitating Change - Using Interactive Methods in Organisations, Communities, and Networks*, L. B. Rasmussen, Ed. Polyteknisk Forlag, DK, 2011.

[14] E. H. Schein, *Organisational Culture and Leadership*, 3rd ed. NY: John Wiley & Sons, 2004.

[15] G. Morgan, *The Images of Organisation*. UK: Sage, 1986.

[16] C. Agyris and D. A. Schön, *Organisational learning: A theory of action perspective*. Reading, MA: Addison-Wesley US, 1978.

[17] T. C. Garrett, D. H. Buisson, and C. M. Yap, “National Culture and R&D and Marketing Integration Mechanisms in New Product Development: A Cross-Cultural Study Between Singapore and New Zealand,” *Industrial Marketing Management*, vol. 36, pp. 293–307, 2006.

[18] R. K. Moenaert, A. de Meyer, and B. J. Clarysse, “Cultural differences in new technology management,” in *Managing new technology development*, W. E. Souder and J. D. Sherman, Eds. McGraw-Hill USA, 1994, pp. 287–314.

[19] G. Hofstede, “Cultural Dimensions In Management And Planning,” *Asia Pacific Journal of Management*, no. January 1984, pp. 81–99, 1984.

[20] G. Hofstede, *Culture’s Consequences: International Differences in Work-related Values*. Beverly Hills, CA: Sage, 1980.

[21] M. Minkov and G. Hofstede, “The evolution of Hofstede’s doctrine,” *Cross Cultural Management: An International Journal*, vol. 18, no. 1, pp. 10–20, 2011.

[22] G. Hofstede and M. Minkov, “Long- versus short-term orientation: new perspectives,” *Asia Pacific Business Review*, vol. 16, no. 4, pp. 493–504, Oct. 2010.

[23] P. A. Hall and D. Soskice, *Varieties of Capatilism: Institutional Foundations of Comparative Advantage*. NY: Oxford University Press, 2001.

[24] P. A. Hall and D. Soskice, “An Introduction to Varieties of Capitalism,” in *Varieties of Capitalism*, .

[25] J. L. Campbell and O. K. Pedersen, “The Varieties of Capitalism and Hybrid Success: Denmark in the Global Economy,” *Working Papers, International Center For Business and Politics, Copenhagen Business School.*, no. 18, 2005.

[26] R. Popper, “How are foresight methods selected?,” *Foresight*, vol. 10, no. 6, pp. 62–89, 2008.

[27] L. Togeby, J. G. Andersen, P. M. Christiansen, and T. B. Jørgensen, *Power and Democracy in Denmark. Conclusions*. Aarhus: Magtudredningen., 2003.

[28] A. Korsgaard and L. Buus, *Vejen til en national forskningsstrategi - et debatoplæg fra Forskningspolitisk Råd*. København: Forskningspolitisk Råd, 1995.

[29] *Teknologisk Fremsyn i Danmark*. København: Teknologirådet, 1999, p. 164.

[30] Regeringen, *Regeringens Erhvervsstrategi .dk21*. Copenhagen: , 2000.

[31] *Progress, Innovation, and Cohesion. Strategy for Denmark in the Global Economy - Summary*. Copenhagen: The Danish Government, 2006.

[32] “OECD-DASTI Horizon Scan,” 2007.

[33] Teknologisk Institut, *Evaluering af Forsk2015*. Copenhagen: , 2009.

[34] *FORSK2015. Et prioriteringsgrundlag for strategisk forskning*. Copenhagen: Danish Ministry for Science, Technology and Innovation, 2008, p. 91.